

Application No.: 10/524,803
Amendment Dated November 6, 2009
Reply to Office Action of June 8, 2009

MAT-8669US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. No: 10/524,803
Applicant: Takaaki Kishigami, et al.
Filed: February 16, 2005
Title: RADIO COMMUNICATION SYSTEM, RADIO COMMUNICATION METHOD,
AND RADIO COMMUNICATION DEVICE
T.C./A.U.: 2419
Examiner: Thanh D. Tran
Confirmation No.: 1028
Docket No.: MAT-8669US

AMENDMENT UNDER 37 C.F.R. § 1.116

Expedited Procedure

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Responsive to the Final Office Action dated June 8, 2009, please amend the above-identified application as follows:

- ☐ **Amendments to the Specification** begin on page _____ of this paper.
- ☐ **Amendments to the Claims** are reflected in the listing of claims which begins on page _____ of this paper.
- ☐ **Amendments to the Drawings** begin on page _____ of this paper and include an attached replacement sheet(s).
- ☐ **Amendments to the Abstract** are on page _____ of this paper. A clean version of the Abstract is on page _____ of this paper.
- ☒ **Remarks/Arguments** begin on page **2** of this paper.

Remarks/Arguments:

Claims 29-35 and 39-43 are pending and rejected in the application. In the response filed on September 4, 2009, claims 29, 30, 34 and 35 were amended and claims 39, 40 and 41 were cancelled. No new matter has been added.

Applicants would like to thank the Examiner for the interview on October 9, 2009. During the interview, Applicants' representatives explained to the Examiner that the mobile station in Applicants' claim 29 computes the channel estimation value and the received quality value, and then transmits both of those values back to the base station. Applicants' representatives then explained that the base station utilizes both the channel estimation and received quality values received from the mobile station to compute the SDM and SDMA evaluation criterions. In view of our arguments, the Examiner stated that he would have to look more closely at the art of record.

On page 2, the Official Action rejects claims 30, 34 and 35 under 35 U.S.C. §112, second paragraph as being indefinite. The Official Action states that the recitation of "*partial-space orthogonalizing means*" does not have proper antecedent basis. Applicants have amended claims 30, 34 and 35 in the previous response to replace the recitation of "*partial-space orthogonalizing means*" with "*partial-space orthogonalizing section*." Withdrawal of the rejection is respectfully requested.

On page 3, the Official Action rejects claims 29, 30, 33, 34, 35 and 39-43 under 35 U.S.C. §103(a) as being unpatentable over Onggosanusi (U.S. 7,110,378) in view of Wallace (U.S. 2002/0193146) and Alastalo (U.S. 2001/0047424). It is respectfully submitted, however, that the claims are patentable over the art of record for at least the reasons set forth below.

Applicants' invention, as recited by claim 29, includes features which are neither disclosed nor suggested by the art of record, namely:

... wherein the SDM transmission evaluation criterion and the SDMA evaluation criterion are to be calculated depending upon a channel estimation value and received quality received from the SDM compatible mobile station and the SDMA mobile station within the communication area ...

Claim 29 relates to judging whether a mobile station is SDM compatible based on SDM evaluation criterion and furthermore judging whether a mobile station is SDMA compatible

based on SDMA evaluation criterion. Specifically, the SDM evaluation criterion and the SDMA evaluation criterion are calculated dependent upon a channel estimation value and a received quality value transmitted by the mobile station. Support for these features can be at least found on pages 28-31 of Applicants' specification and furthermore shown in Figs. 1, 3A and 3B. No new matter has been added.

On page 5 of the Official Action, the Examiner believes that paragraphs [104-106] of Wallace suggest that SDM and SDMA evaluation criterion are calculated based upon channel estimation and received quality values. In paragraph [0104], Wallace suggests that the base station queries the mobile device to determine diversity capabilities (*"starts with a query to the mobile user to determine diversity capability information ... diversity capability information ... includes the number of receive antennas used at the mobile station"*). Furthermore, paragraph [104] suggests that the base station may also request information regarding channel quality of a given link. This feature is explained in paragraph [106] where channel quality is determined by carrier to noise interference ratio (C/I) (*"the base station determines the C/I of the FL to measure link quality. The mobile station may be queried to provide an indication of link quality such as C/I of signals received."*). Thus, it is apparent that Wallace's base station queries the mobile device for its diversity capabilities and link quality. Wallace, however, does not suggest computing the diversity capability of the mobile device based on the link quality (diversity capability is not computed based on C/I or EB/N0). Thus, Applicants' representatives do not agree with the Examiner's interpretation of Wallace of page 5 of the Official Action and on page 2 of the Advisory Action.

In similar art, Alastalo teaches a communication system which utilizes spatial signatures. For example, in paragraphs [057] and [058], Alastalo teaches that in space division multiple access (SDMA) technology, the spatial signatures between mobile devices may be very similar (*"the access point must determine a space division multiple access technology can be applied for it, that is whether the terminal can be served simultaneously with one or more other terminals ... the access point may find the spatial signatures of these terminals to be very similar. Thus, the access point may deduce that they cannot be served simultaneously"*). Thus, Alastalo is determining whether the devices are SDMA compatible based on their spatial signatures (if their spatial signatures are unique, then they are SDM compatible). However, Alastalo does not calculate evaluation criterion based upon the spatial signature and a link quality. Furthermore, in Alastalos' system, the base station computes the spatial signature (the spatial signature is not sent from the mobile station).

Applicants' claim 29, is different than the art of record because SDM evaluation criterion and SDMA evaluation criterion are calculated dependent upon a channel estimation value and a received quality value which are both transmitted by the mobile station ("*... wherein the SDM transmission evaluation criterion and the SDMA evaluation criterion are to be calculated depending upon a channel estimation value and received quality received from the SDM compatible mobile station and the SDMA mobile station within the communication area ...*").

As shown in Applicants' Fig. 1, base station 1 determines whether the mobile stations are SDM compatible and SDMA compatible. This determination is made based upon SDM evaluation criterion and SDMA evaluation criterion. The SDM evaluation criterion and SDMA evaluation criterion are computed based upon channel estimation values and received quality values transmitted by the mobile station to the base station (e.g. mobile station 2-1 transmits both channel estimation value and received value quality value to base station 1). This feature is at least supported on pages 28-31 of the specification ("*the mobile station feeds the calculated channel estimation value ... and the received quality ... back to the base station 1 ... base station 1 decides whether or not SDM transmission is available with the preferentially allocated mobile stations MS ... depending upon an evaluation value calculated*"). Thus, the base station computes SDM and SDMA evaluation criterion based upon both channel estimation value and a received quality value (which are both transmitted to the base station from the mobile station).

Neither Onggosanusi, Wallace, Alastalo nor their combination suggest the features in Applicants' claim 29. Thus, claim 29 is patentable over the art of record for at least the reasons set forth above.

Dependent claims 30, 33, 34, 35 and 42-43 include all of the features of claim 29 from which they depend. Thus, these claims are also patentable over the art of record for at least the reasons set forth above.

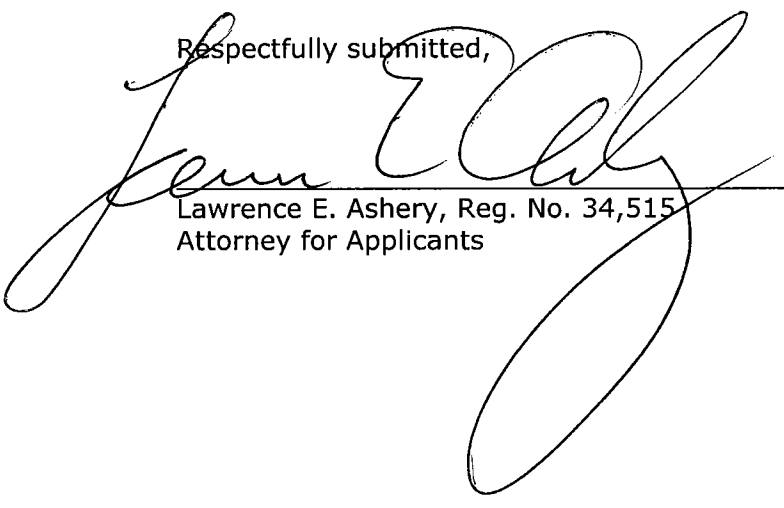
On page 11, the Official Action rejects claims 31 and 32 under the combination of Onggosanusi, Wallace, Alastalo and Walton (U.S. 2003/0128658). Neither Onggosanusi, Wallace, Alastalo, Walton nor their combination suggest the features in Applicants' claim 29. Thus, claims 31 and 32 are patentable over the art of record in view of their dependency on patentable claim 29.

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In view of the arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,



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